

butylphenyl group, a 2,6-dimethylphenyl group, a 3,5-dimethylphenyl group, a 2,4-dimethylphenyl group, a 1,2-dimethylphenyl group, etc., as an aryl group having from 6 to 20 carbon atoms, an alkylaryl group or an arylalkyl group; F, Cl, Br, I, as a halogen; and a pentamethylantimonyl group, a trimethylsilyl group, a trimethylgermyl group, a diphenylarsenyl group, a dicyclohexylantimonyl group, a diphenylboryl group, etc., as an organometalloid group. Specific examples of the substituted cyclopentadienyl group for R<sup>28</sup> and R<sup>29</sup> include a methylcyclopentadienyl group, a butylcyclopentadienyl group, a pentamethylcyclopentadienyl group, etc.

In the invention, concretely, the anion with plural groups bonded to a metal includes B(C<sub>6</sub>F<sub>5</sub>)<sub>4</sub><sup>-</sup>, B(C<sub>6</sub>HF<sub>4</sub>)<sub>4</sub><sup>-</sup>, B(C<sub>6</sub>H<sub>2</sub>F<sub>3</sub>)<sub>4</sub><sup>-</sup>, B(C<sub>6</sub>H<sub>3</sub>F<sub>2</sub>)<sub>4</sub><sup>-</sup>, B(C<sub>6</sub>H<sub>4</sub>F)<sub>4</sub><sup>-</sup>, B[C<sub>6</sub>(CF<sub>3</sub>)F<sub>4</sub>]<sub>4</sub><sup>-</sup>, B(C<sub>6</sub>H<sub>5</sub>)<sub>4</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup>, P(C<sub>6</sub>F<sub>5</sub>)<sub>6</sub><sup>-</sup>, Al(C<sub>6</sub>HF<sub>4</sub>)<sub>4</sub><sup>-</sup>, etc. The cation includes, for example, Cp<sub>2</sub>Fe<sup>+</sup>, (MeCp)<sub>2</sub>Fe<sup>+</sup>, (tBuCp)<sub>2</sub>Fe<sup>+</sup>, (Me<sub>2</sub>Cp)<sub>2</sub>Fe<sup>+</sup>, (Me<sub>3</sub>Cp)<sub>2</sub>Fe<sup>+</sup>, (Me<sub>4</sub>Cp)<sub>2</sub>Fe<sup>+</sup>, (Me<sub>5</sub>Cp)<sub>2</sub>Fe<sup>+</sup>, Ag<sup>+</sup>, Na<sup>+</sup>, Li<sup>+</sup>, etc. The other cations include, for example, those from nitrogen-containing compounds, such as pyridinium, 2,4-dinitro-N,N-diethylanilinium, diphenylammonium, p-nitroanilinium, 2,5-dichloroanilinium, p-nitro-N,N-dimethylanilinium, quinolinium, N,N-dimethylanilinium, N,N-diethylanilinium, etc.; those from carbenium compounds such as triphenylcarbenium, tri(4-methylphenyl)carbenium,

tri(4-methoxyphenyl)carbenium, etc.; alkylphosphonium ions such as  $\text{CH}_3\text{PH}_3^+$ ,  $\text{C}_2\text{H}_5\text{PH}_3^+$ ,  $\text{C}_3\text{H}_7\text{PH}_3^+$ ,  $(\text{CH}_3)_2\text{PH}_2^+$ ,  $(\text{C}_2\text{H}_5)_2\text{PH}_2^+$ ,  $(\text{C}_3\text{H}_7)_2\text{PH}_2^+$ ,  $(\text{CH}_3)_3\text{PH}^+$ ,  $(\text{C}_2\text{H}_5)_3\text{PH}^+$ ,  $(\text{C}_3\text{H}_7)_3\text{PH}^+$ ,  $(\text{CF}_3)_3\text{PH}^+$ ,  $(\text{CH}_3)_4\text{P}^+$ ,  $(\text{C}_2\text{H}_5)_4\text{P}^+$ ,  $(\text{C}_3\text{H}_7)_4\text{P}^+$ , etc.; arylphosphonium ions such as  $\text{C}_6\text{H}_5\text{PH}_3^+$ ,  $(\text{C}_6\text{H}_5)_2\text{PH}_2^+$ ,  $(\text{C}_6\text{H}_5)_3\text{PH}^+$ ,  $(\text{C}_6\text{H}_5)_4\text{P}^+$ ,  $(\text{C}_2\text{H}_5)_2(\text{C}_6\text{H}_5)\text{PH}^+$ ,  $(\text{CH}_3)(\text{C}_6\text{H}_5)_2\text{PH}_2^+$ ,  $(\text{CH}_3)_2(\text{C}_6\text{H}_5)\text{PH}^+$ ,  $(\text{C}_2\text{H}_5)_2(\text{C}_6\text{H}_5)_2\text{P}^+$ , etc.

Of the compounds of formulae (10) and (11), concretely, the following are especially preferred. Preferred examples of the compounds of formula (10) include triethylammonium tetraphenylborate, tri(n-butyl)ammonium tetraphenylborate, trimethylammonium tetraphenylborate, triethylammonium tetrakis(pentafluorophenyl)borate, tri(n-butyl)ammonium tetrakis(pentafluorophenyl)borate, triethylammonium hexafluoroarsenate, pyridinium tetrakis(pentafluorophenyl)borate, pyrrolinium tetra(pentafluorophenyl)borate, N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate, methyldiphenylammonium tetrakis(pentafluorophenyl)borate, etc. Preferred examples of the compounds of formula (11) include ferrocenium tetraphenylborate, dimethylferrocenium tetrakis(pentafluorophenyl)borate, ferrocenium tetrakis(pentafluorophenyl)borate, decamethylferrocenium tetrakis(pentafluorophenyl)borate, acetylferrocenium tetrakis(pentafluorophenyl)borate, formylferrocenium

